

**The Governance of Energy Megaprojects: Politics, Hubris and Energy Security.** Benjamin K. Sovacool and Christopher J. Cooper. Edward Elgar Publishing Limited, The Lyppatts, 15, Lansdown Road, Cheltenham, Glos, GL50 2JA, UK. 2013. vii + 251 pp. Price not mentioned.

The book under review attempts to answer the question why is it that most energy megaprojects seem to fail. An energy megaproject is defined (arbitrarily) as one that involves at least US\$ 1 billion of capital investment and a geographical scale encompassing at least three countries. The authors base their arguments and conclusions on four case studies in Asia – a completed and operational oil pipeline in Azerbaijan, Georgia and Turkey that cost US\$ 4.6 billion; a natural gas pipeline about half completed in Southeast Asia expected to cost US\$ 40 billion if and when completed; a hydroelectric network being built in Sarawak (Malaysia), but expected to be interconnected with Brunei, and Kalimantan (Indonesia) and expected to cost US\$ 105 billion; and a proposed large-scale solar array estimated to cost US\$ 550 billion connecting Mongolia, China, North Korea, South Korea and Japan. This last project is still in the planning stages; no financing has been approved and no construction has begun.

Megaprojects by their nature take a long time to fructify. It is current 'industry wisdom' that it takes two years to connect energy resources within a country, ten years to connect them between two countries, and a 'miracle' to create a multi-cross-country network of distribution involving more than two countries (p. 95). Even though the Energy Charter

Treaty prohibits signatory transit countries from ceasing or reducing existing flows of oil (or gas), even in the face of disputes with other countries (p. 119), pipeline cross-border projects in India's neighbourhood have been difficult to realize.

Megaprojects are (often) approved on the basis of underestimated costs, overestimated revenues, undervalued environmental impacts and overvalued economic development effects (p. 61). The epistemic communities that approve them share an optimistic culture of decision-making that favours massive, rapid landscape changes and rationalizes the exclusion and displacement of affected populations as the natural evolution to modernity (p. 23). Whereas optimism bias is a form of self-deception, strategic misrepresentation (a euphemism) by project managers is intentional and a common practice (p. 46). It is the inability to allocate costs and benefits fairly that dooms most megaprojects before they ever get started (p. 45).

It is possible to be in philosophical agreement with the central tenet of the book, but still question whether the data provided warrant the conclusions. Maxims are stated, but are then forgotten or ignored. Thus, for example, on page 66 the authors state: 'Answering the question of whether a megaproject works – or whether it remains "failed" – cannot be answered prior to its operation and adoption over an extended period of time.' But in their case studies, two of the projects are still at least half incomplete and one has not even broken ground. Yet they proceed to draw conclusions from these case studies.

Similarly, it is not argued convincingly why large projects are preferred. The authors quote an energy facility manager early in the book but ignore him thereafter. 'Size matters – not necessarily from a capital cost or efficiency standpoint, but it takes a lot of effort to do a small project as it does a large project.... Getting smaller projects done requires such a disproportionate amount of senior management attention, legal attention, and other time and effort that it really burdens those projects with greater and greater costs, so that people say it's not worth it' (p. 16). The two other reasons, of course, are the lure of edifice complex and a version of mission creep. When land acquisition becomes difficult, additional units are piled upon existing sites,

as was done in Fukushima and at Tarapore, and is being done at Rawatbhata and Kakrapar.

The projects chosen are supposed to pass through at least three countries. The Southeast Asian pipelines only exist as bilateral pipelines and the Sarawak project so far is limited to Malaysia. The conclusions are not drawn just from their case studies, but also include other single-country megaprojects such as the Hoover Dam and Fukushima plants. The fact that 90% of all infrastructure projects underestimate costs is used to indict energy megaprojects as well. Compared to many other large projects which involve combustion or other chemical reactions, pipelines are relatively environmentally benign at least when they function as designed. They cannot be held responsible, as the authors allege, for the environmental effects associated with the entire fuel cycle.

In connection with the proposed Gobitec solar project, on page 186, the authors state that 'Generation costs for the proposed array would be US\$ 0.18/kWh (assuming a PV module price of US\$ 4 per installed watt). As module (modelled) prices reduced to closer to US\$ 1 per installed watt, researchers found that generation costs decreased to US\$ 0.07/kWh. However, it is unlikely that module prices will decrease to this level any time soon.' Only a year later, the costs are less than a US\$ 1 per peak watt.

The book also contains other typos and mistakes. The authors should have read their proofs more carefully.

In many ways chapter 5 of the book about the Sarawak corridor of renewable energy project has the maximum resonance for Indian readers. It involves the construction of several dams creating reservoirs that entail the displacement and resettlement of tribes. Because it is also the most disturbing, I will quote extensively from this chapter.

Mahathir Mohammad, the then Prime Minister of Malaysia, is on record saying that indigenous people should not be permitted to 'live on maggots and monkeys in their miserable huts, subject to all kinds of diseases'. He went on to add: 'We do not intend to turn the Penan into "human zoological specimens" to be gawked at by tourists and studied by anthropologists while the rest of the world passes them by... It is our policy to eventually bring all jungle dwellers into the mainstream of the nation. There is nothing

romantic about these helpless, half-starved and disease-ridden people and we will make no apologies for endeavouring to uplift their living conditions' (p. 152).

Taib Mahmud, the Chief Minister of Sarawak opines that 'the Penan should not be left to roam the jungles like the Orang-utans' (p. 152). Taking cues from the political leadership, one Malaysian bureaucrat said: 'The indigenous people I have spoken to want to be part of modern society. Sarawak has a large population of young Penan or Kenyah that no longer care about the preservation of culture or their traditional way of life. They want gadgets, cars, nice clothes, and need to learn to survive in the modern economy. They are not interested in picking some fruit in the forest, collecting bananas, hunting pigs. They instead all want to drink beer, get their internet, watch their DVDs, get involved in life' (p. 150).

Another official makes a pitch for the modern economy: 'In a way development is like disturbing a hornets' nest, for it shakes people out of their old system. If you are living in the jungle and have to spend two hours going to school each way, you are not making good economic use of your time, not going to escape poverty. What to do with these people? Take them out of the jungle, don't just give them cash, but train them, embed them in a sense of modernity. Fix them into a community, teach them about the cash economy, investment and savings. Teach them about contract farming, agricultural processing, and other semi-skilled jobs' (p. 150-2).

The NGO respondents tell the authors how policy actually translates on the ground. One explained that 'the Sarawak indigenous people, especially the Penan, do not cultivate land, are not sedentary, and are not going to change. Yet the land code in Sarawak places the onus on communities to establish a claim and accrue evidence that they own the land' (p. 158). Another went on to enumerate the ways in which the odds are stacked against the tribes: 'There are really five ways in which the state government in Sarawak uses the law and the land codes to oppress indigenous people and push through projects. The first is by setting unfair standards for indigenous land tenure. They won't recognize community maps or ancestral claims so that they can claim that the land belongs to the state. The second is by foreclosing access to foraging grounds by encroaching on

where indigenous communities live. The third is by failing to give indigenous people identity cards so that they cannot vote. The fourth is by giving unfair compensation for relocation and resettlement, sometimes just a couple of pigs for relocating an entire village, or giving people "land" but of a lesser quality than the type of land lost, i.e. not as good, in swampy areas, infertile, or with limited or difficult access to plots. The fifth is by making it criminal to oppose projects, by jailing protestors and opponents of the state. I cannot think of a single project energy-wise in Sarawak that has not committed these types of impacts or grievances' (p. 158).

There are also a few accounts of people who were relocated. One elder stated: 'Before we were relocated, we needed no money. We could walk in front of our longhouse and there was the forest, the river, there was everything we needed. Here, we are surrounded, boxed in, blocked. Our way of life has changed forever' (p. 164-6). A person from the Penan tribe said: 'Food is very far from here, and our dogs have forgotten how to hunt. No matter what, we have to stay. We have little money, we need a forest to survive. Loggers take our fruit trees, our firewood, our wood for boats, whatever is in the forest. They are like a great wave taking everything with it. Here we have close to nothing, we are reduced to begging' (p. 164). A fisherman from the Kenyah tribe said: 'My village is upriver from the SCORE dams but I cannot fish anymore, the waters are so murky, water levels are too low. I used to catch by net, but now we cannot see, I used to catch by rod, but now the water is too shallow. Crops are all failing and I've spent the past 3 years in meetings trying to fight the government, with no time for farming or planting.'

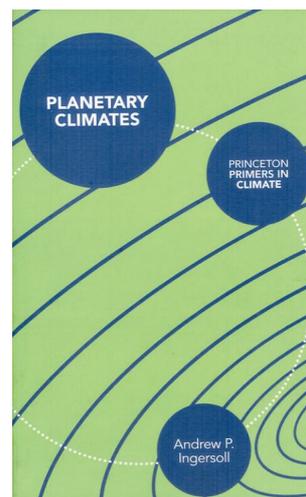
Farmers seemed to have done better than hunters and fishermen. Here is one account: 'In some ways we are living better, we were subsistence farmers before, we now have enough money to send some of our children to school. Our longhouse is made of concrete rather than wood. Most homes have at least one car, one motorcycle, a television, 24 hour electricity for every room, electric fans and kitchen appliances' (p. 148).

As in Aldous Huxley's *Brave New World*, the only option being offered to an insensitive modernism is savage primitivism. When asked to choose bet-

ween the lesser of two evils, we should reject both and look for and find a third way.

DILIP R. AHUJA

*National Institute of Advanced Studies,  
Indian Institute of Science Campus,  
Bangalore 560 012, India  
e-mail: drahuja@gmail.com*



**Planetary Climates.** Andrew P. Ingersoll. Princeton University Press, 41, William Street, Princeton, New Jersey 08540, USA. 2013. 278 pp. Price: US\$ 19.95.

The presence, thickness and composition of atmosphere on a solar system object mostly depends on its mass and distance from the Sun. All the objects with atmospheres will have surface dynamics, principally driven by the interactions and energy inputs/exchange from the Sun and the planet's own internal heat, resulting in the climates and their variations/cycles. On Earth, climate changes are greatly influenced by human intervention in recent times. Decades of research on the palaeoclimatic records on Earth are helping us to decouple the natural and anthropogenic effects and providing a handle for future forecast and suggestions for necessary corrective measures. Other solar system objects with atmosphere and climate, in particular, the terrestrial planets, may serve as natural laboratories to understand the past and future Earth climates. In this connection learning about planetary climates is of importance to human kind. Prior to 1960s, our knowledge about planetary atmospheres and climates was at best